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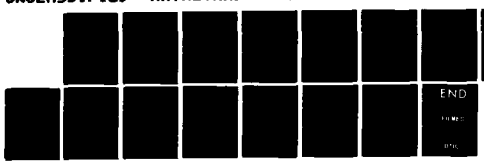

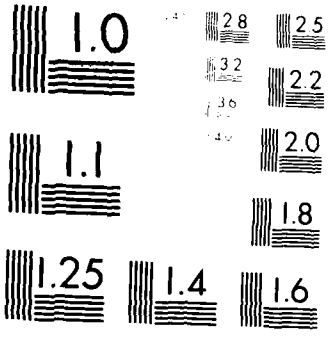

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HEALTH BEHAVIORS: EMPIRICAL CONSISTENCY AND THEORETICAL SIGNIFICANCE OF SUBDOMAINS

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REPORT NO. 84-18

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NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND
BETHESDA, MARYLAND

Health Behaviors: Empirical Consistency and Theoretical Significance of Subdomains[†]

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SUMMARY

Moderate correlations between health behaviors (HB) have led some researchers to study HB one at a time and other researchers to group HB into categories defined by multivariate analyses. Well-defined HB categories could eliminate the need to study discrete behaviors by providing a basis for generalizing results obtained in the study of a given behavior to related behaviors. This study therefore extended prior research regarding HB categories by examining the empirical replicability of HB categories and the possible significance of categorical distinctions for explanatory models for HB.

Questionnaires describing the frequency of 37 HB were completed by 191 young, male volunteers who also completed a multi-dimensional health locus of control (MHLC) questionnaire and measures of the perceived severity and probability of each of 11 illnesses. The HB were factor analyzed by five methods and cluster analyzed to determine HB categories. Pearson product moment correlations described the association between HB and MHLC and rated severity and probability of illness.

Four HB categories were identified: (1) "Health Hazards Avoidance" included behaviors that reduced the risk of illness by minimizing exposure to environmental conditions or behavioral requirements which might overtax the body's adaptive capacity. (2) "Risk Taking" included behaviors which increased the risk of accidental injury, primarily due to driving habits. (3) "Preventive Behaviors" included preventive use of health professionals' services and actions to reduce risk of accidents (e.g., repairing hazards around the home). (4) "Health Hygiene" included behaviors which represented attempts at positive health promotion (e.g., exercise, weight control).

"Health Hazards Avoidance" and "Risk Taking" were not significantly related to MHLC scores, perceived susceptibility to illness, or perceived severity of illness. "Preventive Behaviors" and "Health Hygiene" behaviors were associated with higher rated severity of illness, higher confidence in health care providers, and lower beliefs that chance or fate determine health outcomes. High scores on "Health Hygiene" were also associated with stronger beliefs in personal control of health outcomes.

With appropriate allowances for interstudy differences in the sets of HB studied and the analysis procedures employed, the HB categories identified in this study were consistent with prior research. The HB categories also corresponded

reasonably well to conceptual distinctions between preventive health behaviors ("Preventive Behaviors"), at-risk behaviors ("Health Hazards Avoidance" and "Risk Taking"), and wellness behaviors ("Health Hygiene"). Distinguishing between these subcategories of HB appears to have significance for the development of explanatory models for HB because different patterns of association to health beliefs were found. At this time, the cumulative evidence for HB subcategories is sufficient to shift research attention from exploratory studies to determine whether such subcategories exist to confirmatory hypothesis testing to refine the conceptual distinctions between categories, establish their boundaries with greater precision, and determine how each category is linked to health motivation and other HB determinants.

INTRODUCTION

Health behaviors can be broadly defined as actions undertaken to maintain or improve health (Kasl & Cobb, 1966; Harris & Guten, 1979). Because an ounce of prevention is better than a pound of cure, health behaviors should be encouraged. However, programs to increase the frequency of health behaviors will be effective only if they are based on an adequate understanding of what health behaviors are and why they occur more frequently in some people than in others. One issue in the study of health behaviors is whether health behaviors can be grouped into meaning-full categories which will help promote such understanding (Green, 1970; Harris & Guten, 1979; Langlie, 1977; Tapp & Goldenthal, 1982; Williams and Wechsler, 1972; 1973). This paper explores this issue by attempting to replicate prior empirical categorizations of health behaviors and by relating the resulting categories of health behaviors to measures of health beliefs.

The appropriate level of aggregation for health behaviors is an issue because specific health behaviors are only moderately intercorrelated, leading some investigators to regard health behaviors as essentially independent and others to the position that one or more general health behavior categories or dimensions exist, each encompassing several behaviors (Green, 1970; Harris & Guten, 1979; Langlie, 1977; Steele & McBroom, 1972; Tapp & Goldenthal, 1982; Williams & Wechsler, 1972; 1973). Defining general categories or dimensions of health behaviors could improve our understanding of health behaviors if categories can be identified which are comprised of behaviors with similar causes within a group and different causes between groups.

Available evidence suggests that multiple health behavior categories are appropriate, but does not provide a satisfactory basis for defining specific categories. When a range of health behaviors are included in a single study, analyses consistently produce evidence of multiple factors or clusters. However, the only health behavior category that has clearly, consistently replicated in previous research has been preventive utilization of the services of health professionals. Thus, there is some uncertainty regarding how many replicable health behavior categories can be identified. Until more evidence is available, it is possible that the multivariate analyses in prior studies have capitalized on specific patterns of association that occurred by chance in each study.

The lack of consistent health behavior categories other than preventive medical care may reflect methodological differences between available studies. Both the number of categories identified and the content of those categories can be affected by the choice of specific behaviors for study and/or by the analysis technique chosen to define groupings. No previous study has attempted to replicate both aspects of related work. This study therefore included variables representing the health behavior categories identified by Harris and Guten (1979) and Williams and Wechsler (1972; 1973) to attempt to replicate their findings. Also, both factor analysis and cluster analysis were applied to the data to evaluate the effects of choice of analysis procedures on the number and content of categories.

If replicable subdomains of health behaviors can be identified, the next step for health behavior research will be to determine whether the implied conceptual distinctions facilitate the development of explanatory models for these behaviors. The distinctions will be important if different explanatory models are required for different subdomains. This possibility is explored in this study by relating the frequency of health behaviors in each category identified to health value, including health locus of control, perceived severity of illness, and perceived susceptibility to illness. These health beliefs were selected because they are theoretically related to the motivation to undertake health behaviors and should therefore be important for predicting those behaviors (Rosenstock, 1966; Wallston & Wallston, 1981). A need for different explanatory models would be indicated if behaviors' composites representing the health behavior subdomains had different patterns of association to health beliefs.

METHOD

Sample

The sample consisted of [illegible] marines undergoing 4 weeks of cold weather training. Each marine voluntarily participated after receiving a complete description of the study. The average participant was [illegible] years old, had 11.9 years of education, and [illegible] months of military service. The sample was composed of 67% Caucasian, [illegible]% Black, [illegible]% Hispanic, and [illegible]% other ethnic groups. The distribution of military ranks was [illegible]% Private or Private First Class, 54% Lance Corporal, 15% Corporal, 4% Sergeant and Staff Sergeant, and [illegible]% other ranks.

Health Behaviors

A questionnaire assessing the frequency of 37 health behaviors was developed for this study. The list included the 30 behaviors studied by Harris and Guten (1979) because these behaviors represented the most general list used in prior attempts to define health behavior subcategories, were likely to be understood by most respondents as health behaviors because the list was constructed inductively by interviewing people to determine what they did to promote their health, and focused solely on health behaviors, thereby excluding other types of preventive behavior which might have obscured the health behavior factors.

The final total of 37 behaviors was obtained by supplementing the Harris and Guten (1979) list with six items from Williams and Wechsler (1972; 1973) and one item from Langlie (1977). Eight behaviors included in the Williams and Wechsler (1972; 1973) study had also been studied by Harris and Guten (1979). Thus, the addition of six items means that 14 of 22 items in Williams and Wechsler's (1972; 1973) Sample A list were included in the present study. These 14 items included two or three marker variables for each of the four health-related factors identified by Williams and Wechsler (1972; 1973). This sampling was regarded as adequate to evaluate the replicability of the Williams and Wechsler (1972; 1973) factors (Gorsuch, 1983).

Health Belief Variables

Health belief variables included multidimensional health locus of control (MHLC) and perceived susceptibility to and severity of illnesses. MHLC measures [illegible] and Wallston's [illegible] Internal Control, Powerful Others Control, [illegible] health outcomes. The scales had reasonable internal consistency [illegible] the present sample and evidence of validity from prior research [illegible], General Health Threat, was [illegible] exploratory analyses with this scale [illegible] may have [illegible].

[illegible] was [illegible] that they would experience [illegible]. Ratings were made on a scale from [illegible] Always [illegible]. The health problems were [illegible], [illegible], [illegible] strain or strain of back or shoulder, skin rash or

Green, 1984). Therefore, although the cluster analytic categories may ultimately prove useful for refining health behavior concepts, the following discussion focuses on the factor analytic categories defined in this study.

Taking methodological differences into account, the factor analyses in this study identified four empirically replicable, theoretically meaningful subcategories of health behavior. "Health Hazards Avoidance" includes behaviors that reduce the risk of illness by minimizing exposure to environmental conditions or behavioral requirements which might overtax the body's adaptive capacity. The replicability of this category was evident in the fact that it combined most of Harris and Guten's (1979) "Health Practices" cluster with their "Environmental Hazards Avoidance" cluster, but clearly emphasized the former. The conceptual significance of "Health Hazards Avoidance" derives from its similarity to the concept of "at-risk behaviors," i.e., actions taken by healthy individuals to minimize the probability of developing a specific health condition (Kolbe, 1983).

"Preventive Habits" included the use of health professionals' services and actions to reduce the risk of accidents (e.g., repairing hazards around the home). This category combined Harris and Guten's (1979) "preventive health care" and "safety practices" clusters. This category also included both marker variables for Williams and Wechsler's (1972; 1973) "checkup" factor. Langlie's (1977) identification of an "indirect risk" factor consisting of similar behaviors provides further evidence of the empirical consistency of this category. Conceptually, "Preventive Habits" correspond to "preventive health behaviors," i.e., actions taken by healthy individuals to prevent illness or detect it while in an asymptomatic state (Kolbe, 1983).

"Risk Taking" included behaviors which increased the likelihood of accidents, primarily through risky driving habits. This category corresponded to Williams and Wechsler's (1972; 1973) factor of the same name. A similar factor representing a somewhat broader range of activities was identified by Tapp and Goldenthal (1982). Conceptually, "Risk Taking" could represent the negative aspect of "at-risk behaviors." However, if this equation were made, it would be reasonable to ask why "Risk Taking" and "Health Hazards Avoidance" did not form a single bipolar dimension. Perhaps the emphasis on driving behavior produced a highly specific risk taking factor that is not representative of general risk taking tendencies. With better sampling of these tendencies, "Risk Taking" might merge with "Preventive Habits" to form a bipolar health behavior category. However, Tapp and

Goldenthal (1982) did not find this to be the case and the correlation between these behavior composites in this study did not support this possibility.

The "Health Hygiene" category was more difficult to evaluate than the other categories. The behaviors forming this category may indicate concerns for positive health promotion (e.g., exercise, weight control), but also included behaviors such as "live by religious principles" which are not easily interpreted as indicating such concerns. Initially, the factor was accepted as meaningful because both markers for Williams and Wechsler's (1972; 1973) second factor were assigned to this category. However, both Harris and Guten (1979) and Tapp and Goldenthal (1982) produced findings which combined "Health Hygiene" behaviors with "Health Hazards Avoidance" behaviors. The decision to retain "Health Hygiene" as a separate behavior category was supported by the finding that the "Health Hygiene" composite was significantly related to health beliefs, but "Health Hazards Avoidance" was not. Further justification for a separate "Health Hygiene" category is provided by the correspondence between "Health Hygiene" and the concept of "wellness behaviors," i.e., actions undertaken by healthy individuals to attain even better health. The "Health Hygiene" category probably has been poorly defined in prior research because the health behaviors studied have included few instances of wellness behavior.

The associations between health beliefs and the health behavior composites illustrated the importance of the conceptual distinctions implied by the composites. This study demonstrated at least two, and possibly three, distinct patterns of association between health behavior subcategories and health beliefs. Other studies have shown similar trends (Guten & Harris, 1979; Langlie, 1977), but it is impossible to say whether specific patterns of association have been replicated across studies because of interstudy differences in the health behaviors studied and/or the operationalization of particular health beliefs.

Although extensive interpretation of the health belief-health behavior associations would be premature until these findings have been replicated, two points are noteworthy. First, it is unlikely that general health beliefs will provide a substantial basis for explaining health behaviors. Findings reported by other researchers suggest that the weak associations described here may be representative of the explanatory power of health beliefs relative to health behaviors (e.g., Harris & Guten, 1979; Langlie, 1977; Winefield, 1982; Wallston & Wallston, 1981; Seeman & Seeman, 1983; Allen & Taylor, 1984). Future research therefore

should explore means of improving the prediction of health behaviors, e.g., by considering additional conceptual models (Allen & Taylor, 1984), including measures of health values (Wallston & Wallston, 1981), and incorporating methodological modifications such as increasing the behavioral specificity of the health belief assessments.

The second noteworthy point was that the absence of significant correlations between health beliefs and the "Health Hazards Avoidance" and "Risk Taking" composites was a reminder that behavior which affects health is not necessarily motivated by health concerns. For example, performance of the behaviors in the "Health Hazards Avoidance" category could indicate a liking for physical and psychological comfort rather than a concern for health. This point is important because health motivation is part of the accepted definition of health behaviors (Kasl & Cobb, 1966; Harris & Guten, 1979; Kolbe, 1983). Given this definition, there would be reason to question whether "Health Hazards Avoidance" and "Risk Taking" can be classified as "health behaviors." One implication of this observation is that a re-examination of the definition of health behaviors may be in order. Another implication is that non-health motives should be considered for inclusion in health behavior studies to improve the prediction and understanding of behaviors such as "Health Hazards Avoidance" and "Risk Taking."

The findings of this study, combined with other available evidence, indicate that an intermediate level of aggregation for health behaviors is feasible and appropriate. At present, the categories for such aggregation are ill-defined, but there is sufficient convergence of available findings to illustrate that identifying empirically replicable, theoretically meaningful categories is a reasonable research goal. The emphasis in health behavior research should therefore shift from exploratory studies assessing the feasibility of identifying such categories to confirmatory studies designed to improve the delineation of the number of categories, their behavioral boundaries, and their place in a general model of health behavior.

The preceding discussion of available findings mentioned several gray areas in the current conceptualization of health behaviors that can be addressed in future studies to achieve the above objectives. These gray areas include the breadth of the domain of at-risk behaviors, the possibility that underrepresentation of wellness behaviors has influenced the available findings regarding the number of health behavior categories, an apparent bias toward sampling primar-

ify positive health behaviors so that potentially bipolar health behavior dimensions appear unipolar, and the possibility that "Health Hazards Avoidance" behaviors are not motivated by health concerns. These gray areas suggest possible hypotheses to be tested in future research with systematic sampling of health behaviors and analyses such as confirmatory factor analysis (Gorsuch, 1983, pp. 127-141) to test the goodness of fit between alternative hypotheses and the data. A shift from exploratory studies to testing explicit hypotheses should accelerate the development of explanatory models which can be used to predict health behaviors and to develop programs to modify those behaviors when they are maladaptive.

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This study examined the feasibility and utility of categorizing health behaviors (HB) into subdomains. Prior evidence has been inconclusive because few studies have examined large numbers of HB and because analysis procedures have varied across studies. Data regarding [illegible] HB were obtained from 191 young men. Factor and cluster analyses identified 4 HB categories consistent with prior findings; descriptive labels were "Health Hazards Avoidance," "Risk Taking," "Preventive Habits," and "Health Hygiene." These categories correspond to suggested conceptual distinctions in the HB literature. [illegible]

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